

In re Patent Application of
CLARKE ET AL.
Serial No. 10/777,958
Filed: 2/12/04

In the Claims:

This listing of claims replaces all prior versions and listing of claims in the application.

1. (CURRENTLY AMENDED) A communications system comprising:

 a plurality of data storage devices each using at least one of a plurality of different operating protocols;

 a plurality of mobile wireless communications devices for accessing said plurality of data storage devices and each using at least one of the plurality of different operating protocols; and

 a protocol interface device comprising

 a protocol engine module for communicating with said plurality of data storage devices using respective operating protocols, and

 a front-end proxy module coupled to said protocol engine module and comprising

 a respective proxy module for communicating with said plurality of mobile wireless communications devices using each different operating protocol, and

 at least one common core service module connected to said proxy modules and comprising a renderer module for cooperating with said proxy modules to format data for said plurality of mobile wireless communications devices;

said renderer module being configurable to
define and implement an interface between said
proxy modules and said plurality of mobile
wireless communications devices for supporting a
new different operating protocol.

2. (ORIGINAL) The communications system of Claim 1 wherein said at least one common core service module is for routing traffic between said proxy modules and said protocol engine module.

3. (ORIGINAL) The communications system of Claim 1 wherein said at least one common core service module is for accessing data from said plurality of data storage devices.

4. (ORIGINAL) The communications system of Claim 1 wherein said at least one common core service module is for rendering data for said plurality of mobile wireless communications devices.

5. (ORIGINAL) The communications system of Claim 1 wherein said at least one common core service module comprises a plurality of handlers for interfacing said proxy modules with said protocol engine module.

6. (ORIGINAL) The communications system of Claim 5 wherein said plurality of proxy modules convert access requests from said plurality of mobile wireless communications devices to

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common access parameters; and wherein said front-end proxy module further comprises a flow controller module for receiving the common access parameters from said plurality of proxy modules and selecting desired handlers for processing thereof.

7. (ORIGINAL) The communications system of Claim 5 wherein said plurality of handlers and said protocol engine module communicate using a common interface protocol.

8. (CANCELLED).

9. (PREVIOUSLY PRESENTED) The communications system of Claim 1 wherein said at least one common core service module further comprises an extensible mark-up language (XML) engine module coupled to said renderer module.

10. (ORIGINAL) The communications system of Claim 9 wherein said XML engine module comprises an extensible stylesheet language transformations (XSLT) engine module.

11. (ORIGINAL) The communications system of Claim 9 wherein said at least one common core service module further comprises a memory coupled to said XML engine module for storing a plurality of templates corresponding to respective operating protocols.

12. (CURRENTLY AMENDED) A protocol interface device for interfacing a plurality of mobile wireless communications

devices with a plurality of data storage devices, the mobile wireless communications devices and the data storage devices each using at least one of a plurality of different operating protocols, the protocol interface device comprising:

a protocol engine module for communicating with the plurality of data storage devices using respective operating protocols; and

a front-end proxy module coupled to said protocol engine module and comprising

respective proxy module for communicating with the plurality of mobile wireless communications devices using each different operating protocol, and

at least one common core service module connected to said proxy modules and comprising a renderer module for cooperating with said proxy modules to format data for said plurality of mobile wireless communications devices;

said renderer module being configurable to define and implement an interface between said proxy modules and said plurality of mobile wireless communications devices for supporting a new different operating protocol.

13. (ORIGINAL) The protocol interface device of Claim 12 wherein said at least one common core service module is for at least one of routing traffic between said proxy modules and said protocol engine module, accessing data from said plurality

of data storage devices, and rendering data for the plurality of mobile wireless communications devices.

14. (ORIGINAL) The protocol interface device of Claim 12 wherein said at least one common core service module comprises a plurality of handlers for interfacing said proxy modules with said protocol engine module.

15. (ORIGINAL) The protocol interface device of Claim 14 wherein said plurality of proxy modules convert access requests from the plurality of mobile wireless communications devices to common access parameters; and wherein said front-end proxy module further comprises a flow controller module for receiving the common access parameters from said plurality of proxy modules and selecting desired handlers for processing thereof.

16. (CANCELLED).

17. (PREVIOUSLY PRESENTED) The protocol interface device of Claim 12 wherein said at least one common core service module further comprises an extensible mark-up language (XML) engine module coupled to said renderer module.

18. (CURRENTLY AMENDED) A protocol interface device for interfacing a plurality of communications devices with a plurality of data storage devices, the communications devices and the data storage devices each using at least one of a

plurality of different operating protocols, the protocol interface device comprising:

 a protocol engine module for communicating with the plurality of data storage devices using respective operating protocols; and

 a front-end proxy module coupled to said protocol engine module and comprising

 respective proxy module for communicating with the plurality of communications devices using each different operating protocol, and

 at least one common core service module connected to said proxy modules and comprising a renderer module for cooperating with said proxy modules to format data for said plurality of mobile wireless communications devices;

said renderer module being configurable to define and implement an interface between said proxy modules and said plurality of mobile wireless communications devices for supporting a new different operating protocol.

19. (ORIGINAL) The protocol interface device of Claim 18 wherein said at least one common core service module is for at least one of routing traffic between said proxy modules and said protocol engine module, accessing data from said plurality of data storage devices, and rendering data for the plurality of communications devices.

20. (ORIGINAL) The protocol interface device of Claim 18 wherein said at least one common core service module comprises a plurality of handlers for interfacing said proxy modules with said protocol engine module.

21. (ORIGINAL) The protocol interface device of Claim 20 wherein said plurality of proxy modules convert access requests from the plurality of communications devices to common access parameters; and wherein said front-end proxy module further comprises a flow controller module for receiving the common access parameters from said plurality of proxy modules and selecting desired handlers for processing thereof.

22. (CANCELLED).

23. (PREVIOUSLY PRESENTED) The protocol interface device of Claim 18 wherein said at least one common core service module further comprises an extensible mark-up language (XML) engine module coupled to said renderer module.

24. (CURRENTLY AMENDED) A method for interfacing a plurality of mobile wireless communications devices with a plurality of data storage devices, the mobile wireless communications devices and the data storage devices each using at least one of a plurality of different operating protocols, the method comprising:

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providing a protocol engine module for communicating with the plurality of data storage devices using respective operating protocols; and

coupling a front-end proxy module to the protocol engine module, the front-end proxy module comprising

respective proxy module for communicating with the plurality of mobile wireless communications devices using each different operating protocol, and

at least one common core service module connected to the proxy modules and comprising a renderer module for cooperating with the proxy modules to format data for the plurality of mobile wireless communications devices;

the renderer module being configurable to define and implement an interface between the proxy modules and the plurality of mobile wireless communications devices for supporting a new different operating protocol.

25. (ORIGINAL) The method of Claim 24 wherein the at least one common core service module is for at least one of routing traffic between the proxy modules and the protocol engine module, accessing data from the plurality of data storage devices, and rendering data for the plurality of mobile wireless communications devices.

26. (ORIGINAL) The method of Claim 24 wherein the at least one common core service module comprises a plurality of

handlers for interfacing the proxy modules with the protocol engine module.

27. (ORIGINAL) The method of Claim 26 wherein the plurality of proxy modules convert access requests from the plurality of mobile wireless communications devices to common access parameters; and wherein the front-end proxy module further comprises a flow controller module for receiving the common access parameters from the plurality of proxy modules and selecting desired handlers for processing thereof.

28. (CANCELLED).

29. (CURRENTLY AMENDED) A computer-readable medium having computer executable modules for interfacing a plurality of mobile wireless communications devices with a plurality of data storage devices, the mobile wireless communications devices and the data storage devices each using at least one of a plurality of different operating protocols, the computer-readable medium comprising:

a protocol engine module for communicating with the plurality of data storage devices using respective operating protocols; and

a front-end proxy module for communicating with the protocol engine module and comprising

respective proxy module for communicating with the plurality of mobile wireless communications devices using each different operating protocol, and

at least one common core service module connected to the proxy modules and comprising a renderer module for cooperating with the proxy modules to format data for the plurality of mobile wireless communications devices;

the renderer module being configurable to define and implement an interface between the proxy modules and the plurality of mobile wireless communications devices for supporting a new different operating protocol.

30. (ORIGINAL) The computer-readable medium of Claim 29 wherein the at least one common core service module is for at least one of routing traffic between the proxy modules and the protocol engine module, accessing data from the plurality of data storage devices, and rendering data for the plurality of mobile wireless communications devices.

31. (ORIGINAL) The computer-readable medium of Claim 29 wherein the at least one common core service module comprises a plurality of handlers for interfacing the proxy modules with the protocol engine module.

32. (ORIGINAL) The computer-readable medium of Claim 31 wherein the plurality of proxy modules convert access requests from the plurality of mobile wireless communications devices to common access parameters; and wherein the front-end proxy module further comprises a flow controller module for

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receiving the common access parameters from the plurality of proxy modules and selecting desired handlers for processing thereof.

33. (CANCELLED).